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PHILADELPHIA AND KETCHIKAN OFFICES ABOLISHED IN CONSOLIDATION

The Fourth Coast Guard District, comprising the eastern part of the State of Pennsylvania, the State of Delaware, and the lower part of the state of New Jersey, with headquarters in Philadelphia, has been abolished as a separate operating unit. Control of Coast Guard units in this area has been transferred to and consolidated with the Third Coast Guard District, having headquarters in New York. This is a return to the operating plan in effect prior to World War II, a fourth district having been created for wartime purposes in order that Coast Guard operations might more closely parallel the Navy's district organization.

The disestablishment of the Fourth District became effective at midnight on June 30. The district had first been established on November 30, 1940.

At the same time, the Seventeenth Coast Guard District, the headquarters of which was located at Ketchikan, Alaska, was consolidated with the thirteenth district, with offices at Seattle, Wash. In this consolidation, the shore and operational units serving in Alaska will continue to serve the area, but their administration will be in the hands of the district commander at Seattle.

The Commandant also disestablished the North Atlantic Ocean Patrol, effective June 30, the command of all units operating under this designation passing to the commander of the First Coast Guard District.

CONGRESSIONAL DELEGATION MAKES ANNUAL INSPECTION OF ACADEMY

The Congressional Board of Visitors, which each year makes an inspection of the Coast Guard Academy on behalf of the United States Congress, met at New London on May 24. Guided by Admiral Joseph F. Farley, Commandant of the Coast Guard, and Rear Admiral James Pine, Superintendent of the Academy, they toured the grounds, the various buildings, and the training facilities, having lunch with the cadets in the barracks mess hall. In addition to the Commandant, three other officers from headquarters were present. They were Rear Admiral Merlin O'Neill, assistant commandant; Commodore Halert C. Shepheard, chairman of the Merchant Marine Council; and Capt. A. C. Richmond, chief, Planning and Control Staff.

The following comprised the Congressional delegation: The Honorable Fred Bradley, Michigan; the Honorable T. Millet Hand, New Jersey; the Honorable Aime J. Forand, Rhode Island; the Honorable Horace Selly-Brown, Jr., Connecticut; the Honorable Henry M. Jackson, Washington; and the Honorable John J. Allen, Jr., California.

Following their inspection of the Academy, the Board of Visitors met in executive session. Business which came before this meeting was not completed, and a second meeting is to be convened in Washington in the near future. The report of the Board of Visitors to Congress will be released after this second meeting.

COAST GUARD PRESENTS PAPERS TO INTERNATIONAL LIFEBOAT CONFERENCE

Papers on a number of subjects connected with life-saving were presented by the Coast Guard to the International Lifeboat Conference held in Oslo, Norway, July 8–10, through its delegate Capt. Harold C. Moore. A number of

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the subjects presented, such as airborne lifeboats, rocket line-throwing devices, emergency radio transmitters, and aircraft in rescue work, were the direct outcome of wartime activities, particularly those of air-sea rescue.

Following are the titles of the papers presented:

Recent Developments in Building Lifeboats for the U. S. Coast Guard, by M. R. Daniels, captain (E), USCG.

Introduction of Amphibious Lifesaving Vehicles to the U. S. Coast Guard, by S. H. Evans, captain, USCG.

Diesel Engine Installations in Coast Guard Motor Lifeboats, by Alfred Hansen, principal naval architect, USCG.

Exposure Treatment, by Lt. Comdr. W. G. Budington.

The Airborne Lifeboat.

The Gliderborne Lifeboat.

The Rocket Line-Throwing Gun.

The Handie Talkie, VHF Emergency Transmitter-Receiver.

The Gibson Girl Emergency Transmitter.

Exposure Suits.

Solar Stills for Distilling Sea Water.

New Search Plans.

Open Sea Seaplane Operations.

Pyrotechnics in Sea-Air Rescue.

The Kytoon.

The Helicopter Applied to Search and Rescue.

The Hanks Rescue Basket.

Sound Fixing and Ranging.

EXPERIMENTAL RADAR REFLECTORS FOR BUOYS PROVE SUCCESSFUL

The Coast Guard has developed and successfully demonstrated an experimental device to improve the usefulness of buoys and channel markers as aids to navigation for the rapidly growing number of vessels now using radar equipment. The new device, termed a "radar reflector," increases the strength of the radar echo from the ordinary buoy structure and thus makes it detectable at greater distances and through worse conditions of interference, such as that from rough, choppy seas, known as "sea-clutter" when viewed on a radar screen. The action of the device is similar to that of a good mirror, properly pointed to reflect light flashes back to the observer and can be compared, in this respect, to the familiar reflectors used on automobile highway signs and markers to make them show up better when illuminated by automobile headlights. Only in this case, of course, the reflection is the radar beam sent out from the ship, returned by the reflector and made visible to the navigator on the viewing screen of his radar equipment.

Although only experimental models of this device, one of which is illustrated mounted on top of a standard buoy, have so far been constructed, sufficient information has been obtained from tests and demonstrations to prove definite usefulness in some such forms or applications. Increased distance ranges of detection on the type of buoy pictured, up to twice the range for an ordinary buoy, were demonstrated at the recent International Meeting on Marine Radio Aids to Navigation (IMMRAN) in New London, Conn., during the first week in May 1947. This meeting, which was attended by delegates from most of the nations of the world to consider the latest developments in electronic aids to ship navigation, concluded that the radar reflector was a useful device and recommended continued experimentation to develop suitable types for use wherever needed. The U. S. Coast Guard is therefore continuing work along this line to develop more efficient designs, mechanically adaptable to buoy structures or other similar markers wherever they may be required to increase the usefulness of aids to radar navigation by mariners.

COAST GUARD'S AUTHORITY OVER ANCHORAGE AREAS IS TERMINATED

Authority of the Coast Guard for the establishment and disestablishment of prohibited, restricted, and anchorage areas, conferred by the Espionage Act (50 U. S. C. 191) and Proclamation No. 2412 of June 27, 1940, has been terminated by Proclamation 2732, signed by the President on May 31.

Authority to control anchorage areas is returned to the War Department for administration under peacetime statutes. Enforcement of regulations by the Coast Guard is in no way affected.

The War Department has adopted the regulations promulgated by the Coast Guard and contained in part 6, chapter I, title 33, CFR. Changes to anchorage regulations now pending at Coast Guard headquarters will be forwarded to the War Department.

MESS MEMBERSHIP OPEN TO COAST GUARD OFFICERS

Coast Guard officers on active duty are eligible for membership in commissioned and warrant officers' messes operated ashore by the Navy. In addition to extending membership to officers of the Coast Guard, the Bureau of Naval Personnel has announced that Army and Coast Guard officers on active duty do not have to be attached to or

serving at or near the activity furnishing mess as announced previously.

COMMODORE EUGENE A. COFFIN IS AWARDED LEGION OF MERIT

"For exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as District Coast Guard Officer, Fourth Naval District, from April 1942 to April 1945, and as District Coast Guard Officer, Fourteenth Naval District, from July to September 1945," Commodore Eugene A. Coffin was awarded the Legion of Merit, which was presented to him at the annual meeting of the Coast Guard district commanders held in Washington on June 3, 1947.

Commodore Coffin's citation goes on to say that he was "Responsible for maintaining the security of our ports, safeguarding the uninterrupted flow of vessel traffic in port and on navigational routes and increasing the safety of the men and property in the Merchant Marine, Commodore (then Captain) Coffin rendered invaluable service in the performance of his vital duties. In addition, he aided in the successful prosecution of many special wartime projects assigned to the Coast Guard, some of which included the protective patrol of our coast line, the organization of escorts for naval vessels, and the manning of naval transports. His professional skill, leadership, and devotion to duty were in keeping with the highest traditions of the United States Naval Service."

SIAMESE REAR ADMIRAL VISITS COAST GUARD TO LEARN OF NAVIGATIONAL AIDS

Rear Adm. Luang Jolbhan Brudhikrai, of the Siamese Navy, accompanied by Capt. Khantjitphol Abhakorn, naval attaché of the Siamese Legation in Washington, visited Coast Guard headquarters on June 2 to confer with the personnel of the Aids to Navigation Division. Rear Adm. Brudhikrai is in this country studying various naval matters, and wished to acquire, for the benefit of his country, a knowledge of the system of aids to marine navigation maintained by the United States.

AN EARLY LIFESAVING DIFFICULTY

An edict of Henry I, of England, who reigned from 1100 to 1135, that if any person survived in the foundering or stranding of a vessel it should not be deemed a wreck, while humane in one respect, was not to the liking of those who made their living by taking possession of goods and cargo which floated ashore. These wreckers consequently did what they could to see that there were no survivors, right down to the beginning of the nineteenth century. That was one of the greatest difficulties which handicapped the British Lifeboat Institution in its early days.—From the Nautical Magazine, of Glasgow.

SERVICE AVIATORS DEVELOP EMERGENCY FLOTATION GEAR FOR HELICOPTERS

To increase the safety of helicopter operation over water by making possible emergency landings, the Coast Guard's rotary wing development project, which is headed by Comdr. Frank A. Erickson, has designed and fabricated emergency flotation gear for a helicopter of the HOS–1 type. This flotation gear consists of an inflatable rubber ring, greatly resembling a rubber liferaft, which is fitted around each of the landing wheels. For normal flight, the flotation gear, in deflated condition, is housed within a canvas cover in such a manner that it does not interfere with the rubber-tired landing wheels contacting the ground. When an emergency landing on water is necessary, the pilot, by operating a suitable valve, releases carbon dioxide gas which flows to each of the flotation units, inflating them with a pressure of 1½ pounds per square inch. The area of the pads is sufficient to support the plane upon the water.

The flotation gear was designed by the project commander and installed and tested at the Elizabeth City Air Station, being fitted to plane CG 75605. Tests made in the vicinity indicated that safe landings could be made on comparatively smooth water with this gear. Landings were also made on marshy ground too soft to support the weight of the helicopter when resting on the standard landing wheels.

While conceived originally to facilitate emergency landings, this new flotation gear promises to have distinct value in many rescue situations. The rescue of the survivors of the Belgian plane at Gander offer such an example. The points at which the helicopter had to pick up its passengers in that instance was ground which was too soft to permit a safe landing and take-off. To make the operation possible, sufficient lumber had to be flown in from which to build a tiny "landing field."

From the tests conducted to date it appears feasible to operate a helicopter with flotation gear fully inflated for

moderate distances, the gear reducing the cruising speed by about 12 miles per hour only. When once inflated, the flotation pads can be deflated and housed only by landing the plane on a solid surface.

BOARD MAKES PRELIMINARY REPORT ON TEXAS CITY FIRE AND EXPLOSION

The Coast Guard board appointed to inquire into the causes of the fire and explosion on the S. S. *Grandcamp*, at Texas City, Tex., on April 16, has rendered its preliminary report to the Commandant. Admiral Farley, in making this report public, has announced that he has recommended to the Secretary of the Treasury the appointment of an interdepartmental board to make an exhaustive study of the characteristics of ammonium nitrate and to make recommendations looking to the adoption of rules regarding its handling and transportation.

The preliminary report of the Coast Guard board has brought out the following facts:

The explosion on the S. S. *Grandcamp* was preceded by a fire of undetermined origin. Smoking by personnel in the area of No. 4 hatch was admitted.

The initial explosion resulted in complete destruction of the S. S. *Grandcamp*. This caused major damage to two other vessels, the S. S. *Wilson B. Keene* and the S. S. *Highflyer*. The *Highflyer* later exploded, destroying itself and the *Keene*.

The S.S. *Grandcamp*, a Liberty type vessel built in Los Angeles, Calif., 1942, was owned by the Republic of France and operated by the Compagnie Generale Transatlantique, commonly known as the French Line, of Paris, France. The S.S. *Wilson B. Keene* and the S.S. *Highflyer* were American vessels.

The cargo involved (ammonium nitrate) in the initial explosion originated from three ordnance plants of the U. S. Army.

Samples of ammonium nitrate taken directly from these three ordnance plants have been tested and preliminary results indicate nothing abnormal about the material which was not previously known. The quantities tested did not explode or significantly decompose upon the use of rifle bullets, blasting caps, blasting caps and 60 percent dynamite booster, fire and oil, closed iron pipe and fire, contact with metals heated to 700° F., impact apparatus, severe friction between metal surfaces and other test variants.

The material, described on an original bill of lading as "Fertilizer Compound (manufactured fertilizer), NOIBN, Dry, in paper bags (fertilizer grade Ammonium Nitrate)," was packed in moistureproof multi-ply paper bags of 100 pounds net weight, each. The bags were marked "Fertilizer, Ammonium Nitrate, Nitrogen 32.5%." The regulations require that shipments should be billed as ammonium nitrate and the bags specifically marked "Ammonium Nitrate" although other descriptive material may be added.

All shipments of material moved by rail from point of origin to Texas City terminals. The shipments were stored in a warehouse on pier O pending shipment abroad.

The S. S. *Grandcamp* arrived at Texas City and berthed at pier O on the morning of April 11, 1947.

Loading of the ammonium nitrate into Nos. 4 and 2 lower holds of the *Grandcamp* began about 1 p. m. on the 11th. Stevedoring operations included handling from the warehouse to storage in the holds. Loading continued in No. 4 lower hold until 5 a. m. April 15, at which time 880 tons were stowed in No. 4 hold and some 1,400 tons in No. 2 hold. No. 4 main hatch was closed and secured for the night.

Loading operations were resumed at No. 4 hatch shortly after 8 a. m. on April 16. At this time there was no smoke visible in the hold. A draft of bags remained unstowed from the previous evening's shift. The port-side gang of workmen of the morning shift began to stow these bags while the starboard-side gang sat down awaiting the first draft of bags from topside.

Between 8:15 and 8:20 a. m. smoke without flames was observed in No. 4 lower hold starboard side, center, between hull and cargo battens—an open space about 8 inches wide. Portable fire extinguishers were used and the smoke stopped temporarily. It reappeared, accompanied by small flames along the starboard side of the hold. An alarm was sounded on the ship's whistle. All persons were ordered out of the hold. A ship's fire hose was partially lowered into the hatch but at no time was water turned on. The second captain (first officer) ordered that no water be used although other ship's hose was available and the ship's fire pump was operating at full working pressure. The hatch was then covered and a tarpaulin put in place and wet down. Vent cowls were sealed. Steam was introduced into the hold through the steam smothering system.

Despite efforts to smother the fire, the fire continued to spread and the volume of smoke, orange in color, increased. All crew members left the vessel and

assembled on pier O to assist members of the local fire department. It was not determined how many hoses (from the dock) were actually brought to bear or how effective they could ever be, with the greater portion of No. 4 hatch covers in place.

About 9:15 a. m. (approximately 55 minutes after discovery of the fire), the material in No. 4 hold exploded. This explosion demolished 60 percent of pier O and left the remaining 40 percent beyond repair,

An undetermined amount of ammonium nitrate in warehouse on pier O remained intact in the debris. This material was water-washed overboard with fire hose, except for certain samples which were sent to four separate testing laboratories. The results of the tests of these samples have not yet been received.

Fires broke out at various points in the marine terminal, including warehouses on piers O and A, petroleum storage tanks, oil lines, and in the plant of the Monsanto Chemical Company. Pier A is next adjacent to pier O. A dense black smoke carried over and blanketed the pier area throughout the day and night. The fires in warehouses C and A carried fumes of burning sulphur, stored in warehouse A, over and across the *S. S. Highflyer* and the *S. S. Wilson B. Keene.*

The *Highflyer* was moored to pier A, a "dead ship" in that its main turbine casing was lifted for purpose of inspection. Prior to the *Grandcamp* explosion but in view of the fire on that vessel, loading of the *Highflyer* was suspended, hatches were closed and tarpaulins laid and wet down, and fire stations were manned by the crew.

The *Grandcamp* explosion parted the *Highflyer's* mooring lines causing the *Highflyer* to drift over alongside the *Wilson B. Keene.* There was major damage to structure and machinery of the *Highflyer.* Necessity of medical attention for injured, the shock and dazed condition of crew, and the presence of smoke together with fumes of burning sulphur made it mandatory that all personnel leave the ship. By 10:30 a. m. (April 16) this was done.

Similar fire security action was taken on board the *Keene,* moored to pier B on the south side of the slip in which the *Highflyer* was berthed.

At about 8:50 a. m., April 16, two tugs were dispatched from Galveston for the purpose of assisting a vessel reported to be on fire at Texas City. En route, an explosion was heard. Upon arrival at Texas City turning basin at 9:50 a. m., the tugs found it impossible to enter the harbor due to dense smoke, fumes, and debris. The tugs sighted and removed survivors from the floating debris, then returned to Galveston.

Immediately following the *Grandcamp* explosion all Coast Guard craft in the Galveston area proceeded to Texas City. The CG–64309 arrived at 9:45 a. m., and was particularly helpful in fire and rescue efforts. Coast Guard auxiliary units also participated.

The Coast Guard cutter *Iris* arrived at Texas City about 10:40 a. m. Injured and dead were taken aboard and the vessel, along with all other vessels, was then ordered to evacuate the area. The *Iris* returned at 3 p. m., but found it impossible to enter any slip for firefighting or towing because of smoke, acid fumes, and debris in and under the slips. At 7:40 p. m. the *Iris* was again ordered to evacuate the area.

That evening, about 8 p. m., because of rumors of a possible explosion on the *Highflyer* (which had 860 tons of ammonium nitrate in No. 3 hold), dispatch of four Galveston tugs was requested. Difficulty in getting proper equipment (gas masks, oxy-acetylene burning tools, etc.) delayed their arrival at Texas City until 11 to 11:20 p. m. Sparks and burning embers were observed coming from the *Highflyer.* Personnel boarded the *Highflyer* and several attempts were made to move the vessel but were unsuccessful due to parting towlines, wreckage, smoke, fire, and fumes (there was burning sulphur in No. 2 and 4 holds). A white smoke was observed coming from No. 3 hatch. All rescue workers were transferred from the *Highflyer* to one of the tugs and the attempts to tow the ship from its berth was abandoned at 12:55 a. m., April 17.

The *Highflyer* exploded at 1:10 a. m., April 17. The dock area had been evacuated and only one life was lost due to this explosion. This explosion completely destroyed the *Highflyer* and that portion of the *Wilson B. Keene* abaft No. 2 hatch, and wrecked the remaining portion of this vessel. The *Keene* had on board a cargo consisting only of flour.

During loading operations on the *Grandcamp,* no specific instructions were issued to longshoremen with respect to smoking. There was general understanding that "no smoking" on deck or in the holds was permitted, but this restriction was not respected. Prohibitions against smoking were printed in the French language on various parts of the exterior of the ship. No such signs in English were posted. Control of smoking on deck and in the holds was lax. There was smoking on the main deck near No. 4 hatch.

No specific instructions on the stowage of the ammonium nitrate material were issued to the longshoremen. Broken or torn paper bags were not refilled or repaired but were stowed in the holds in violation of Coast Guard "Regulations Governing Explosives and Other Dangerous Articles on Board Vessels."

Ammonium nitrate has been named a dangerous substance in Coast Guard regulations since April 9, 1941. The regulations classify the nitrate as an oxydizing material subject to rapid decomposition when exposed to temperatures above 400° F.

Another applicable section of Coast Guard regulations requires that the shipper give written notification in advance to the vessel regarding the characteristics of a dangerous cargo being shipped. This was not done in the instant case.

No derelictions in the performance of duty were found on the part of personnel of the S. S. *Highflyer* or the S. S. *Wilson B. Keene.*

Hardly without exception all persons who testified before the Board and were concerned with the handling, storage, and transportation of the ammonium nitrate material displayed a lack of knowledge of the provisions of regulations governing the safety of the operations either by land or water.

The preliminary report of the Board is not looked upon as conclusive from the point of view of preventing similar explosions of ammonium nitrate and is incomplete pending receipt of the results of certain tests. Further study is indicated in view of the fact that ammonium nitrate has been transported for more than 25 years without any explosive phenomenon, and Coast Guard investigatory jurisdiction is limited to the marine transportive phase only and in disasters of this type other than marine interests are involved.

Due to the unusual nature and seriousness of the Texas City disaster and as a means of exhausing every possible avenue of information regarding its basic cause, Admiral Farley has recommended to the Secretary of the Treasury the creation of a committee consisting of representatives from the Departments of State, Treasury, War, Navy, Interior, Agriculture, Commerce, and the Interstate Commerce Commission, the Maritime Commission, and the Bureau of Explosives.

The committee, as recommended by the Commandant, U. S. Coast Guard, would seek to determine every aspect of the characteristics of ammonium nitrate, develop additional information relative to its hazards in transportation, evaluate suggestive proposals for assuring safety in transportation, handling and stowage, and recommend a national policy in conformity with these objectives.

In the meantime, the Coast Guard has notified all shipping agents in ports loading ammonium nitrate to properly prepare ships' holds in accordance with existing regulations and take every precaution to prevent fires. The Coast Guard also has recommended that each ship loading ammonium nitrate cargo provide fire watches.

The Coast Guard establishes regulations with respect to the general handling and stowage of all materials that are explosive or potentially dangerous substances, and such regulations are binding upon all shippers, owners, masters and agents in charge.

MERCHANT MARINE DETAILS IN FOREIGN PORTS ARE BEING DISCONTINUED

Coast Guard merchant marine details in foreign ports, established during the war to facilitate the safety of life and property at sea and for the purpose of conducting investigations into merchant shipping matters, have been discontinued. These details were located in the following ports:

Antwerp, Belgium.
Bremerhaven, Germany.
London, England.
Cardiff, Wales.
Le Havre, France.
Marseille, France.
Naples, Italy.
Piraeus, Greece.
Shanghai, China.
Manila, Philippine Islands.
Trieste, Venezia Giulia.

Coast Guard representatives will be maintained for the time being in London and Manila, to facilitate the disestablishment of the other offices.

During the war the Coast Guard activated a total of 36 foreign Merchant Marine details for the purpose of performing "on-the-spot" services in connection with the preventive aspects of safety of life and property of the United States merchant marine.

In addition to limited vessel inspectional services, shipment and discharge of seamen, and licensing and certificating, the Merchant Marine details performed related functions of marine casualty investigations, and investigations and hearings of acts of incompetency, misconduct, negligence, unskillfulness, or willful violation of law by licensed and certificated members of the Merchant Marine.

The above functions will now revert to continental United States ports in which there are located Coast Guard marine inspection offices.

COAST GUARD PRESENTS NINE PAPERS AT MARINE RADIO AIDS CONFERENCE

Coast Guard representatives presented nine papers on electronics subjects at the recent International Meeting on Marine Radio Aids to Navigation, held in New York and New London (reported in the June issue of the COAST GUARD BULLETIN). These speakers and writers and their subjects, were as follows:

Commander O. C. Rohnke—United States Anti-Collision and Navigational Radars.

Lt. Comdr. Guy L. Ottinger—Utilization of Radar Beacons and Reflectors.

Lt. Comdr. C. M. Daniels—U. S. Marine Radiobeacons.

Capt. Lawrence M. Harding—Practical Progress in Loran for Marine navigation.

Commander P. V. Colmar—Improvements in Loran Equipment for Shipborne Use.

Commander E. K. Rhodes—Marine Aids to Navigation Broadcasts.

Capt. Harold C. Moore—Ocean Station Vessel Marine Services.

Rear Adm. Earl G. Rose—Progress in Radio Navigational Aids.

Electronic Navigational Aids — A Coast Guard pamphlet.

Rear Adm. Earl G. Rose, Chief, Office of Operations, discussed the progress which had been made in radio navigational aids, first reviewing the history of the radiobeacon system, the shore-based radio direction finders, and then the wartime developments such as high-frequency direction finding, radar, Loran, and the European electronic systems. He succinctly summarized the position of the United States with regard to a standardized international system of radio aids to navigation in the following words:

"In summary, a world Loran system is in existence; the war has provided many of us with experience and training on how to use this system; engineering and technical knowledge if not already on hand is available for the asking; there is already in existence equipment for reorientation and readjustment of the system for peacetime use; and a great part of the world is already charted for use of Loran. It is my own opinion that we would be unwise indeed to deny ourselves the use of these existing facilities in the hope that at some future date a more completely satisfactory system might be installed.

"A complete technical and operational discussion of the Decca system has been presented by representatives of the United Kingdom. It appears that the operational tests conducted in the vicinity of the British Isles have been highly successful and that some progress has been made in resolving the lane identification problem inherent in this system. There seems to be no question as to the accuracy of this system once this problem has been resolved.

"We in the United States have carefully studied the application of this system to our needs and have met with some questions which should be mentioned for further thought by those members of this meeting who might be forced to consider these same questions due to a similar order of things in their home countries. We have long coast lines, bordering in most cases upon the open oceans. Ships arriving at our ports from other countries and in many cases from port to port within the United States must enter our navigation systems from fixes determined well out at sea. On the other hand the area where the Decca system has been used lies in the center of a series of shipping routes from northern and northwestern Europe. Ships entering the British radio navigational aid systems from these areas are able to do so from highly accurate departures on fixed visual aids. Much of our coast line and surrounding areas well out to sea are covered with fog for days at a time during certain seasons of the year. We cannot use a medium distance system that cannot be positively entered from a dead reckoning position well out at sea. Further, a critical examination shows that a considerable number of medium range navigational systems is required to give complete coastal coverage. This is exemplified by the large number of radio beacons in use in the United States. Some of the critical requirements of the Decca systems are that the system must be in continuous operation—that is, it cannot be used on a time-shared basis as is the case with radiobeacons, and it cannot tolerate interference on the same frequency. In the case of radiobeacons, many of these are placed on the same frequency by making a careful choice of areas and radiated powers and even though some interference might occasionally occur, it is not fatal to the system as is the case with Decca. For these reasons it appears that we in the United States must choose the somewhat less accurate radiobeacon system to

serve our medium distance aid requirements, well knowing that in doing so we are sacrificing the extremely high accuracy that might be obtained with the Decca system. * * *

"It appears to me, from a purely operational and practical standpoint, that Providence has set a limit on the amount of over-all navigational usefulness which we can extract from any radio navigational-aid system. In the end it is at best a compromise as to which choice we make. In the case of Loran we increase the amount of shipboard equipment to obtain additional accuracy, reliability and range, whereas in Consol we reduce the amount of shipboard equipment at a sacrifice of accuracy and acceptance of the somewhat dangerous practice of using communication receivers, removed from the bridge of the ship and not under the direct control of navigating personnel. In the case of Decca we obtain high accuracy at the expense of introducing lane identification, which again requires additional shore station equipment and shipboard components to resolve the difficulty. In the case of radiobeacons we sacrifice some accuracy to gain a wide use of the system on long shore lines by means of shared time and frequency. I believe that this clearly indicates the way that we must proceed in the consideration of World Radio Aids to Navigation. We must at best reach a compromise. Above all we must bear in mind that should we fail to agree we will deny marine and air transportation an opportunity to utilize the tremendous technical developments that have been made in this field."

Capt. L. M. Harding's paper, entitled "Practical Progress in Loran for Marine Navigation," briefly summarized some of the practical experience in providing Loran service and in actual operational use of Loran by merchant ships and civil aircraft. Of particular interest were his remarks on the new Loran ground station equipment with expected greater coverage and reduced personnel requirements. The following are excerpts from this portion of his paper:

"New Loran ground station transmitting equipment is now under construction for installation in the near future. It provides considerably higher power, narrower band-widths, and increased radio-frequency stability. Standard Loran now occupies a nominal 0.1 megacycle band-width but the new equipment is expected to reduce this band-width by about one-third with little or no detrimental effect on system accuracy or any change in the basic system except for considerably increased Loran service radius, improved signal to noise ratio, and a reduction in interference to and from other services, all accruing from the reduced band-width. Through use of higher power the present nominal daytime average service radius of 750 nautical miles will possibly be extended to around 1,000 miles but the most distant night service would probably remain at the present nominal 1,400-mile radius. There are even remote possibilities, through advanced receiver-indicator design, of extending the daytime service to as much as 1,200 miles. These seem to be the immediate approximate long-distance limits of exploitation of the standard Loran system without extended research.

"Loran transmitting stations in wartime were often operated with a personnel complement consisting of 9 to 13 technical people plus supporting members such as cooks, base maintenance men, etc. This comparatively large complement was typical of that required by any newly developed system operated under wartime conditions. Since the conclusion of the war the further perfection of automatic equipment, accompanied by studies and tests as to how these may be safely utilized with a minimum of operating people, has resulted in the plan to employ only 4 technicians to operate each new station or old station as it becomes completely modernized. The number of supporting people will be correspondingly reduced so that it is expected that the total staff will be similar to that used at an ordinary lighthouse, radiobeacon, and fog signal station. Where a Loran station can be installed at an existing activity such as, for example, a lighthouse, the extra personnel required will be very small.

"Similar treatment of Loran monitor stations is expected to result in the assignment of not more than one or two technicians, and where the station may be combined with another activity, such as a lighthouse, it may be unnecessary to supply any additional personnel for Loran purposes. Monitor stations are normally located so that they may serve two or more Loran rates. The new equipment will not be constantly supervised since it is fully automatic, but it is equipped with alarm devices and will be attended.

"In comparison with older types of radio aids to navigation the cost of Loran service operation may at first appear to be high. However, when the factors of range and accuracy are considered Loran appears to be economical. For example, a comparison with radiobeacon

installations follows in the table below. The number of stations of each type is that required for a navigational line of position along a coastal area.

System	Square miles (day area)	Square miles (night area)	Accuracy (day)	Accuracy (night)
Class A radiobeacon (1 station)	62,500	62,500	2.0° at 200 miles	2.0° at 200 miles.
Loran 100 kw. (2 stations)	644,000	2,274,000	0.2° at 800 miles	0.3° at 1,500 miles."

Capt. Harold C. Moore presented a paper on Ocean Station Vessel Marine Services, from which the following has been abstracted:

"There had been considerable discussion during this meeting regarding radio aids to marine navigation pointing directly to certain systems and methods for accomplishing the specific function of position fixing with some mention of anticollision devices. Actually marine navigation includes a much broader field than that of position fixing alone. In addition, radio aids to marine navigation includes such things as distress and alerting communications, weather broadcasts, medical-aid communcations, safety and warning broadcasts, communications regarding routing of vessels and in some cases direct radio communications between vessels on the high seas. * * *

"Fortunately for marine interests, the requirements of ocean air transport have forced the issue for a proper ocean weather reporting system, and hand in hand with this system has come a windfall for the marine shipping industry in the form of a proper rescue-vessel dispersion on the high seas, these vessels being completely equipped with modern telecommunication facilities. This places in the hands of those concerned with safety of life and property at sea the most potential tool for distress prevention and relief that has ever existed.

"In the most restricted sense an ocean weather station is merely a floating weather observation post. The station is equipped and manned as are the hundreds of other Weather Bureau stations throughout the world. The purpose of all these stations is to observe, periodically, the various meteorological elements, surface and upper air, and transmit this information to a central Weather Bureau for distribution, evaluation, and use. In this manner the ocean station vessel is providing a platform, in a fixed location in the ocean, from which weather observations can be made. * * *

"The first steps to establish ocean weather stations on a permanent peacetime basis were taken at the North Atlantic Route Conference of PICAO in Dublin, Ireland, in March 1946, when it was recommended that 13 ocean stations be established at specified locations in the North Atlantic area. This recommendation of the Dublin conference was approved by PICAO at Montreal, and a conference of the North Atlantic States to implement this plan was called in London in September 1946. At this Ocean Weather Observation Station Conference, the following Governments agreed to participate in financing and operating the 13 recommended stations: Belgium, Canada, France, Ireland, the Netherlands, Norway, Sweden, the United Kingdom, and the United States. The agreement calls for the United States to operate 7 of the 13 stations and 1 additional station jointly with Canada. This agreement is an example of international cooperation to promote safety, regularity, and economy in intercontinental commerce. It provides a pattern for such cooperation by which nations could participate in furnishing other vitally needed facilities, like long-range aids to navigation, in accordance with their use of such facilities. These facilities of general use need never come out of one nation's pocket.

"As previously stated, the primary function of the ocean-station vessels is to observe and transmit weather information. Briefly, the observations consist of routine surface observations and obtaining the temperature, humidity, and pressure in upper levels by radiosonde observations, also determining the force and direction of upper-level winds by tracking with radar a free balloon carrying a radar target or reflector.

"It is understandable that the ocean weather stations are located primarily to fulfill meteorological needs. In practice, this requires that the vessels be placed some 600 to 700 miles apart. Such arrangement, fortunately, establishes an almost perfect listening net for distress traffic on the international marine distress frequency of 500 kilocycles. Logical, then, is their additional function as search and rescue units. Ocean

weather-station vessels also provide navigational data to aircraft and ships, make oceanographical and other scientific observations, and perform such other functions as may be prescribed.

"Specifically, the services performed by the ocean weather-station vessels which are useful to maritime interests can be listed briefly as follows: Improved weather forecasts; use of radiobeacon signal for both position fixing, and homing; radio relay service (ships business and weather reports); medical advice and assistance; improved distress watch on 500 kcs. plus additional distress watch on 8280 kcs.; radar weather detection; ice information and advice as to other ships in the vicinity in case of distress. All or most of these services, useful to surface vessels, are part of the tradition of the sea and expected from a Coast Guard vessel wherever found. * * *

"It can readily be seen, therefore, that the ocean station vessels fit smoothly into the comprehensive problem of marine navigation and constitute an important part of an integrated system to promote increased safety of life and property at sea."

COAST GUARD OFFICERS PARTICIPATE IN INSTITUTE OF NAVIGATION MEETING

The Coast Guard was represented at the recent meeting of the Institute of Navigation by Lt. Comdr. A. W. Wuerker, USCG, deputy executive assistant, Search and Rescue Agency, as well as by other Coast Guard officers who are members of the organization. The institute meeting was held in Washington on June 23 and 24.

Commander Wuerker's talk dealt with search and rescue, and from it the following extracts have been made:

"Search and rescue as a military operation is an established fact. Military services among themselves attempt to provide adequate measures for search and rescue to meet their own needs.

"The needs and requirements of the search and rescue program for overwater transport, both for aircraft and surface vessel, are well established and are fulfilled by the Coast Guard.

"The need for a search and rescue program for domestic civil aviation was realized over 2 years ago, at which time a special drafting committee, including representatives of the Army Air Forces, Navy, Coast Guard, and Civil Aeronautics Administration prepared Manual for the Control of Instrument Flight Rule Traffic. * * * Section 4 of this manual is entitled 'Procedures for Alerting Search and Rescue Facilities.'

"The purpose of including a part on search and rescue in this manual was to assure standard search and rescue alerting procedure. * * *

"The search and rescue subcommittee of the air coordinating committee currently is making a study of the requirements of a search and rescue program to meet the needs of domestic civil aviation as well as the international obligations of the United States. This study has progressed to a point where certain fundamentals are recognized. First, a complete search and rescue program must begin with the indoctrination in search and rescue practices and techniques of pilots and crews as well as of all operational personnel. Such indoctrination applies equally to the potential survivors as it does to the rescuers. Proper indoctrination may even include procedures for briefing aircraft passengers as to the location and operation of emergency escape hatches, just as you would expect to be told in a passenger surface vessel the location and operation of your lifejacket and the location of your assigned lifeboat. Second, and most important, effective search and rescue requires coordination. This is based on the well-established fact that no single organization can set aside for search and rescue purposes alone all of the facilities required to effect a search or rescue. Protection for public emergencies requires certain minimum facilities, to be sure, as shown by the need for city police and fire departments. However, when the expense of maintaining a full-time, fully equipped fire department cannot be justified, as in many rural communities, you will find volunteer fire departments established.

"Coordinaion is defined as the act of bringing into common and cooperative action all available facilities, both public and private, in the conduct of search and rescue. The search-and-rescue program also includes the requirement of standardization of emergency procedures. Many rescues have actually been accomplished by assisting a distressed airborne aircraft to a safe landing. Finally, when an aircraft has actually crashed or is presumed to have crashed, a search-and-rescue program requires that facilities be provided to physically search for and return the survivors to safety; such as rescue parties, helicopters, or crash boats. * * *

"During the war it was found and proven that disasters called for cooperation between all participating agencies which had facilities at their disposal to render aid. The coordination of

these facilities called for experience and training. From this current search and rescue practices were evolved, in that the single agency with primary responsibility for rendering aid is the one to coordinate the effort of the other Federal or private agencies having facilities in the particular area. * * *

"Thus we arrive at the international importance of search and rescue. Although the United States participated in and signed the 1929 Convention on Safety of Life at Sea, it was not until the *Morro Castle* and *Mohawk* disasters precipitated a congressional investigation that the United States in 1936 ratified this convention, being the last signatory to ratify.

"It has now been many years since the provisions of the 1929 convention were drafted, and spurred by the war many developments have taken place to point up discrepancies between present-day good practices and the existing international treaty standards. With this situation before it, a special shipping committee recommended in a report, dated March 11, 1944, that immediately upon the conclusion of the war an international conference on safety at sea should be held. Following up the recommendation of the special shipping committee, a meeting was called of the representatives of the various Government departments whose interest might be affected, and as a result the Commandant of the Coast Guard was designated to undertake the task of preparing for submission the United States' proposals to such an international conference. In the preparation, now taking place, the functions of a group committee on "rescue procedures" includes instructions to a subcommittee in search and rescue '* * * consider the establishment through mutual effort or contribution of facilities for the rescue of surface vessels and aircraft flying over the oceans. It should also consider the responsibility of merchant ships to go to the aid of aircraft in distress and vice versa.'

"Paralleling the accent on international maritime safety, the International Civil Aviation Organization became a reality on April 4, 1947. The preamble to the Convention on International Civil Aviation states, in part: 'Therefore the undersigned governments having agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner' * * *

"As a matter of record, article 25 states: 'Each contracting State undertakes to provide such measures of assistance to aircraft in distress in its territory as it may find practicable, and to permit, subject to control by its own authorities, the owners of the aircraft or authorities of the States in which the aircraft is registered to provide such measures of assistance as may be necessitated by the circumstances. Each contracting State, when undertaking search for missing aircraft, will collaborate in coordinated measures which may be recommended from time to time pursuant to the convention.'

"As a result of the groundwork laid by the Provisional International Civil Aviation Organization, certain international standards and recommended practices for search and rescue, as well as for the establishment of certain minimum search and rescue facilities, have been recommended to PICAO. PICAO also has recognized in the recommended standards the need for and value of coordination. Among the recommended search and rescue facilities are rescue coordination centers, defined as: 'A center established by the appropriate authority to initiate, coordinate, and terminate search and rescue within a designated area.'

"The Coast Guard's Rescue Coordination Center at 42 Broadway, N. Y., which covers the Atlantic and Caribbean coasts of the Uunited States, handles an average 20 distress cases per day. In the month of April 1947 alone, picked at random, there were 104 cases involving aircraft, and 511 involving vessels or minor mishaps, all of which involved assistance to over 1,000 persons.

"Those who have worked for the advancement of search and rescue have been aware of overlapping requirements as regards maritime, telecommunications, and aviation. Such overlapping occurs particularly in standardization of emergency procedures and equipment. As a result of concerted effort, current proposals contemplate the establishment of a Committee on International Maritime, Telecommunications and Aviation Coordination, or CIMTAC. Discussions on this proposal currently are proceeding in the International Telecommunications Union Conference at Atlantic City, in the Provisional Maritime Consultative Council at Paris, in the International Civil Aviation Organization, and in the Economic and Social Council of the United Nations."

"In closing, I should like to point out some of the more serious problems of the search and rescue picture of civil aviation as it exists today: There is no

Federal agency responsible to provide search and rescue facilities for civil air crashed on land. Examples are the recent airline crashes in Maryland and West Virginia; there is no Federal agency responsible for the coordination of search and rescue for civil air crashed on land, for either commercial or private flying; there is no Federal agency responsible for prescribing minimum standards or inspecting local crash facilities at civilian airports; there is no Federal agency responsible for the dissemination of information for the indoctrination of civil pilots and passengers, or of local civil crash-truck or crash-boat crews in rescue and survival procedures; there is no standard high or very high distress frequency for civil aviation. With most civil aircraft not equipped to transmit on the standard international distress frequency of 500 kcs. the result, by way of comparison, is getting the busy signal on the telephone when you are trying to report a fire; there is no Federally required passenger briefing as to the location of emergency exits and the operation of safety belts or other safety devices, as is now traditional in marine transport."

DECORATIONS AND AWARDS MADE SINCE MAY

LEGION OF MERIT

Derby, Wilfrid N., rear admiral.

COMMENDATION RIBBON

Ayers, Kingdrel N., lieutenant.
Baylis, John S., commodore (ret.).
Blauhut, Bernard B., lieutenant (junior grade) (R) (ret.).
La Raia, Nicholas A., WT1c (R).
Marston, James G., RdM2c (R).
Parsons, Robert W., MoMM3c.
Patton, Jr., William A., RM3c (R).
Pellegrinelli, Mario G., coxswain.
Wendland, James C., commander.
Wright, Laurence H., S1c (R).
Sprow, Ned W., commander.

PRESIDENTIAL UNIT CITATION

Smith, Seward S., CBM.
Matlack, Jr., Charles P. T., S1c.

COMMANDANT'S CITATION

Kurth, Donald J., CY (R).
Zarrilli, Reuben A., senior surgeon, USPHSR.

CHANGES IN ASSIGNMENT

Capt. Vernon E. Day, cutter *Tampa* to Yard.
Capt. Floyd J. Sexton, from commander Fourth Coast Guard District to commander First Coast Guard District.
Commander Victor F. Tydlacka, cutter *Mojave* to *Tampa* as commanding officer.
Lt. Comdr. Cornelius G. Houtsma, from First Coast Guard District Office to Massachusetts Institute of Technology (naval construction and engineering course).
Lt. Comdr. Louis H. Hirschy (R), commissioned May 15 and assigned to active duty, marine inspection, Seattle, Wash.
Lt. Comdr. James J. Maddigan (R), marine inspection, Buffalo, to marine inspection, Chicago.
Lt. Comdr. Charles P. McFaull (R), marine inspection, Pascagoula, to marine inspection, Mobile.
Lt. Comdr. George W. Walker (R), marine inspection, Manila, to marine inspection, Long Beach.

HOME PENDING RETIREMENT

Commander George A. Piper.
Lt. Comdr. Christie T. Christiansen.
Lt. Comdr. Osmond Faulkingham.
Lt. Comdr. Charles I. Quitsgaard (R).
Chief Carpenter Lloyd L. Dough, physical disability.
Chief Pay Clerk James E. Devitt, physical disability.
Ship's Clerk Spencer L. Midgett, 30 years service.
Lt. Henry Y. Clements.
Lt. Edwin A. Himel.

DEATHS

Lt. Comdr. Jesse L. McIver (R), at Jacksonville, Fla., May 25.
Gunner Karl Johansson (ret.), at Miami Beach, Fla., May 31.

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